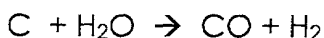


CLAIMS

1. Procedure for the production of hydrogen from a gaseous hydrocarbon, characterised in that it comprises a hydrogen generation phase in which the hydrocarbon is decomposed in the presence of a catalyst at high temperature, according to the following reaction:



and a catalyst regeneration phase with steam or water with elimination of the carbon deposited on the catalyst, according to the reaction:



in which the reaction gas ($CO + H_2$) from the catalyst regeneration phase is re-used as a source of energy.

2. Procedure according to claim 1, characterised in that the reaction gas from the catalyst regeneration phase is re-used as a source of energy in the process itself.

3. Procedure according to claim 1 or 2, characterised in that the two phases are performed, at least for a certain amount of time, parallel, in at least two retorts which operate alternatively generating hydrogen and regenerating the catalyst.

4. Procedure according to claim 1, 2 or 3, characterised in that the temperature of the cracking phase is between 1000 °C and 1100 °C.

5. Procedure according to claim 1, 2 or 3, characterised in that the retort(s) are filled or coated with catalyst supported on a ceramic material.

6. Procedure according to claim 5, characterised in that the catalyst is nickel-based.

7. Procedure according to claim 6, in which the catalyst contains

nickel at 4% or more.

8. Procedure according to claim 1, 2 or 3, characterised in that the hydrogen obtained is cooled and stored or used in fuel cells.

9. Procedure according to claim 2, characterised in that the
5 reaction gas from the regeneration phase is used for generating steam and/or for heating the retort(s).

10. System for the production of hydrogen from a gaseous hydrocarbon according to the procedure of claim 1 or 2, characterised in that it comprises:

- 10
- a retort (A or B)
 - a hot chamber (C) enclosing the retort;
 - means for supplying the hydrocarbon (a_1 , a_2) to the retort;
 - means for supplying the steam (b_1 , b_2) to the retort;
 - means for supplying combustible gas (f_1) to a burner (g_1) of the hot
 - 15 chamber;
 - means for supplying the regeneration gas to an external heat generator and/or to a steam generator and/or to a burner (g_2) in the hot chamber.

11. System for the production of hydrogen from a gaseous
20 hydrocarbon according to the procedure of claim 3, characterised in that it comprises:

- two retorts(A and B);
- a hot chamber (C) enclosing the retorts;
- means for supplying hydrocarbon (a_1 , a_2) alternatively to the
- 25 retorts;
- means for supplying steam alternatively (b_1 , b_2) to the retorts;
- means for supplying combustible gas (f_1) to a burner (g_1) of the hot chamber;
- means for supplying the regeneration gas to an external heat

generator and/or to a steam generator and/or to a burner (g₂) in the hot chamber.

12. System, according to claim 10 or 11, characterised in that the retort(s) use a catalyst supported on a ceramic material.

5 13. System according to claim 10 or 11, characterised in that the hot chamber (C) is provided with a heat exchanger (11) connected to a steam generator (13).

14. System according to claim 10 or 11, characterised in that it comprises, at the outlet of the retort(s), a heat exchanger (12) for
10 cooling the gases produced.